

## **REMARKS**

Favorable reconsideration is respectfully requested.

The claims are 1 to 8. Claim 1 is currently amended.

The amendment to claim 1 is supported on page 16, line 13 of the specification.

No new matter is added.

### **Claim Rejections-35 U.S.C. § 103(a)**

Claims 1-4, 6, and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Saitoh et al. (U.S. 6,638,562) in view of Nagano et al. (JP 5043597).

Claims 5 and 7 are also rejected under 35 U.S.C. § 103(a) as being unpatentable over Saitoh et al. in view of Nagano et al.

Applicants respectfully traverse each of these rejections.

The present invention is directed to a process for producing soybean protein comprising heating a solution containing soybean protein and then fractionating at an ionic strength of 0.02 to 0.2, and a pH of 4.5 to 5.6. The present process produces a soluble fraction and an insoluble fraction.

As conceded by the Examiner, Saitoh et al. do not disclose or suggest the fractionation of 7S protein at the presently claimed ionic strength and pH. See page 3, lines 3-4, of the Official Action.

Nagano et al. discloses fractionation of 7S protein at an ionic strength of 0.2-0.3 and a pH of 4.8-5.2. However, the method of Nagano et al. requires cooling for a long period of time and centrifugation at high G upon fractionation. The method of Nagano et al. also discloses recovery of 7S protein remaining in supernatant by dilution of the ionic strength of the supernatant to less than 0.2 in order to insolubilize the 7S protein after fractionation. See Nagano et al., English abstract. Therefore, the method of Nagano et al.

requires a cooling apparatus, and a strong centrifuge, as well as dilution upon recovery of 7S protein from the supernatant. See Nagano et al., Example 1.

On the other hand, the present inventors have unexpectedly discovered that the solubility properties of soybean protein are altered by heating under acidic conditions, and at the ionic strength recited in claim 1. See the present specification page 6, line 21 to page 7, line 3. Thus, according to the present invention the fractionation of 7S protein can be efficiently carried out without a cooling apparatus and a strong centrifuge and without the dilution described by Nagano et al., which discloses heating soybean protein under acidic conditions. Furthermore, the present specification on page 17, line 19 to page 18, line 3 states as follows:

After the heating treatment, the fractionation may be performed at the same temperature, although it is preferable to ensure a cooling for controlling any microbes. The fractionation may be accomplished by using a known separation procedure (such as filtration and centrifugation), and an easy separation can also be accomplished especially by using a continuous centrifuge (such as a decanter). It is a matter of course that the use of a non-continuous centrifuge such as a batch centrifuge is not excluded.

Accordingly, in the present invention:

- (A) the solubility properties of soybean protein are altered by heating under acidic conditions;
- (B) protein other than 7S protein is separated as a precipitate by adjusting the ionic strength to between 0.02 and 0.2, and pH from 4.5-5.6; and
- (C) the pH is further adjusted to between 4.0-5.0 to recover an insoluble fraction as 7S protein precipitate. See page 18, lines 22-23 of the specification.

Therefore, according to the present invention, high purity 7S protein is efficiently obtained by fractionation at ordinary temperatures without requiring phytase as in Saitoh et al., and the dilution of Nagano et al.

The present invention is therefore not disclosed or suggested by Saitoh et al. in view of Nagano et al.

Furthermore, one of ordinary skill in the art would have no motivation or suggestion to combine Nagano et al. with Saitoh et al., since the method of Nagano et al. is not analogous to the present invention, and does not address, or even mention, the problems solved by the present invention as described above.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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